

SEQUENCE LISTING

<110> Kimoto, Norihiro
Yamamoto, Hiroaki

<120> ALPHA-KETO ACID REDUCTASE, METHOD FOR PRODUCING THE SAME, AND
METHOD FOR PRODUCING OPTICALLY ACTIVE ALPHA-HYDROXY ACIDS USING THE
SAME

<130> SHZ-015

<140>

<141>

<150> JP 2002-207507

<151> 2002-07-16

<160> 15

<170> PatentIn Ver. 2.1

<210> 1

<211> 954

<212> DNA

<213> Leuconostoc mesenteroides

<220>

<221> CDS

<222> (1) .. (954)

<400> 1

atg aaa ata gct att gca gga ttt ggt gca ctt ggt gca cga tta ggt	48
Met Lys Ile Ala Ile Ala Gly Phe Gly Ala Leu Gly Ala Arg Leu Gly	
1 5 10 15	
gtc atg ctc cag gct ggt ggc cat gag gtt acc ggg att gat ggt tgg	96
Val Met Leu Gln Ala Gly Gly His Glu Val Thr Gly Ile Asp Gly Trp	
20 25 30	
ccg gca cat att gct gct att aat aca aaa ggt tta aca gtc gtt aaa	144
Pro Ala His Ile Ala Ala Ile Asn Thr Lys Gly Leu Thr Val Val Lys	
35 40 45	
gat aat gat gca cca caa aag tat ttt gta cca gtt atg ccg gca agt	192
Asp Asn Asp Ala Pro Gln Lys Tyr Phe Val Pro Val Met Pro Ala Ser	
50 55 60	
gaa gtg aca ggc aca ttt gat tta att att tta ctc act aaa aca cca	240
Glu Val Thr Gly Thr Phe Asp Leu Ile Ile Leu Leu Thr Lys Thr Pro	
65 70 75 80	
caa cta gac cgc atg tta aca gat att cag cct att ata acg gat act	288
Gln Leu Asp Arg Met Leu Thr Asp Ile Gln Pro Ile Ile Thr Asp Thr	
85 90 95	
aca aaa tta ttg gta tta tca aac ggt ttg ggt aat att gaa gtg atg	336
Thr Lys Leu Leu Val Leu Ser Asn Gly Leu Gly Asn Ile Glu Val Met	
100 105 110	
gca aag cac gtg tca cgc cat caa att ttg gct ggt gtc aca tta tgg	384
Ala Lys His Val Ser Arg His Gln Ile Leu Ala Gly Val Thr Leu Trp	

115	120	125	
aca tcg tca cta ata aag	cca ggt gaa ata cat	gtt act ggt agt ggc	432
Thr Ser Ser Leu Ile Lys	Pro Gly Glu Ile His	Val Thr Gly Ser Gly	
130	135	140	
tct att aaa tta caa gca	att ggc gat gct gat	gtc caa agt ata gcg	480
Ser Ile Lys Leu Gln Ala	Ile Gly Asp Ala Asp	Val Gln Ser Ile Ala	
145	150	155	160
gat gct ttg aat cag gct	ggc tta aac gcc gaa	att acc cca gat gtg	528
Asp Ala Leu Asn Gln Ala	Gly Leu Asn Ala Glu	Ile Thr Pro Asp Val	
165	170	175	
atg aca gca att tgg cat	aag gca ggt atc aac	gcg gtg ctc aat cct	576
Met Thr Ala Ile Trp His	Lys Ala Gly Ile Asn	Ala Val Leu Asn Pro	
180	185	190	
tta tcc gtg ttg tta aat	gca aat att gct gaa	ttt ggc aca gct ggc	624
Leu Ser Val Leu Leu Asn	Ala Asn Ile Ala Glu	Phe Gly Thr Ala Gly	
195	200	205	
aat gcc atg gat cta gca	ttg aat att cta gat	gag atg aag caa gtt	672
Asn Ala Met Asp Leu Ala	Leu Asn Ile Leu Asp	Glu Met Lys Gln Val	
210	215	220	
ggc gcg tca caa ggc att	aaa gtt gac gtt agt	ggc att atg acg gac	720
Gly Ala Ser Gln Gly Ile	Lys Val Asp Val Ser	Gly Ile Met Thr Asp	
225	230	235	240
ttg agt cag tta ctt aaa	cca gaa aat gca ggt	aat cat ttt ccg tca	768
Leu Ser Gln Leu Leu Lys	Pro Glu Asn Ala Gly	Asn His Phe Pro Ser	
245	250	255	
atg tac caa gat att caa	aat ggt aaa cgt act	gaa att gat ttc ttg	816
Met Tyr Gln Asp Ile Gln	Asn Gly Lys Arg Thr	Glu Ile Asp Phe Leu	
260	265	270	
aat ggt tac ttt gcc aag	ata gga cac gaa tct	ggc att ccg acc cct	864
Asn Gly Tyr Phe Ala Lys	Ile Gly His Glu Ser	Gly Ile Pro Thr Pro	
275	280	285	
ttc aat gcc tta gtg aca	cgg tta att cat gct	aag gaa gat att gaa	912
Phe Asn Ala Leu Val Thr	Arg Leu Ile His Ala	Lys Glu Asp Ile Glu	
290	295	300	
cgt gtt aaa tta gca aaa	cag caa gaa aac ttt	gaa att tga	954
Arg Val Lys Leu Ala Lys	Gln Gln Glu Asn Phe	Glu Ile	
305	310	315	

<210> 2

<211> 317

<212> PRT

<213> Leuconostoc mesenteroides

<400> 2

Met Lys Ile Ala Ile Ala	Gly Phe Gly Ala Leu	Gly Ala Arg Leu Gly
1	5	10
Val Met Leu Gln Ala Gly	Gly His Glu Val Thr	Gly Ile Asp Gly Trp
20	25	30

Pro Ala His Ile Ala Ala Ile Asn Thr Lys Gly Leu Thr Val Val Lys
 35 40 45
 Asp Asn Asp Ala Pro Gln Lys Tyr Phe Val Pro Val Met Pro Ala Ser
 50 55 60
 Glu Val Thr Gly Thr Phe Asp Leu Ile Ile Leu Leu Thr Lys Thr Pro
 65 70 75 80
 Gln Leu Asp Arg Met Leu Thr Asp Ile Gln Pro Ile Ile Thr Asp Thr
 85 90 95
 Thr Lys Leu Leu Val Leu Ser Asn Gly Leu Gly Asn Ile Glu Val Met
 100 105 110
 Ala Lys His Val Ser Arg His Gln Ile Leu Ala Gly Val Thr Leu Trp
 115 120 125
 Thr Ser Ser Leu Ile Lys Pro Gly Glu Ile His Val Thr Gly Ser Gly
 130 135 140
 Ser Ile Lys Leu Gln Ala Ile Gly Asp Ala Asp Val Gln Ser Ile Ala
 145 150 155 160
 Asp Ala Leu Asn Gln Ala Gly Leu Asn Ala Glu Ile Thr Pro Asp Val
 165 170 175
 Met Thr Ala Ile Trp His Lys Ala Gly Ile Asn Ala Val Leu Asn Pro
 180 185 190
 Leu Ser Val Leu Leu Asn Ala Asn Ile Ala Glu Phe Gly Thr Ala Gly
 195 200 205

 Asn Ala Met Asp Leu Ala Leu Asn Ile Leu Asp Glu Met Lys Gln Val
 210 215 220
 Gly Ala Ser Gln Gly Ile Lys Val Asp Val Ser Gly Ile Met Thr Asp
 225 230 235 240
 Leu Ser Gln Leu Leu Lys Pro Glu Asn Ala Gly Asn His Phe Pro Ser
 245 250 255
 Met Tyr Gln Asp Ile Gln Asn Gly Lys Arg Thr Glu Ile Asp Phe Leu
 260 265 270
 Asn Gly Tyr Phe Ala Lys Ile Gly His Glu Ser Gly Ile Pro Thr Pro
 275 280 285
 Phe Asn Ala Leu Val Thr Arg Leu Ile His Ala Lys Glu Asp Ile Glu
 290 295 300
 Arg Val Lys Leu Ala Lys Gln Gln Glu Asn Phe Glu Ile
 305 310 315

<210> 3

<211> 15

<212> PRT

<213> Leuconostoc mesenteroides

<400> 3

Met Lys Ile Ala Ile Ala Gly Phe Gly Ala Leu Gly Ala Arg Leu
 1 5 10 15

<210> 4

<211> 10

<212> PRT

<213> Leuconostoc mesenteroides

<400> 4

Leu Gly Val Met Leu Gln Ala Gly Gly His
 1 5 10

<210> 5

<211> 10

<212> PRT
<213> Leuconostoc mesenteroides

<400> 5
Thr Glu Ile Asp Phe Leu Asn Gly Tyr Phe
1 5 10

<210> 6
<211> 29
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:Artificially
Synthesized Sequence

<220>
<221> misc_feature
<222> (27)
<223> n indicates any one of a, t, c or g

<400> 6
ctgaagctta tgaarathgc hathgcngg

29

<210> 7
<211> 32
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:Artificially
Synthesized Sequence

<220>
<221> misc_feature
<222> (30)
<223> n indicates any one of a, t, c or g

<400> 7
cagaagcttt gdccdccdgc ytgyarcatn ac

32

<210> 8
<211> 32
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:Artificially
Synthesized Sequence

<220>
<221> misc_feature
<222> (30)
<223> n indicates any one of a, t, c or g

<400> 8
ctgaagcttg gygthatgyt dcargchggg gg

32

<210> 9
 <211> 32
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence:Artificially
 Synthesized Sequence

<400> 9
 gtcaagcttt adccrttyar raartcdaty tc 32

<210> 10
 <211> 32
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence:Artificially
 Synthesized Sequence

<400> 10
 ctgaagctta chgaratyga yttyytdaay gg 32

<210> 11
 <211> 785
 <212> DNA
 <213> Leuconostoc mesenteroides

<400> 11
 ggatttggtg cacttggtgc acgattaggt gtcattgctcc aggctgggtg ccatgagggt 60
 accgggattg atgggtggcc ggcacatatt gctgctatta atacaaaagg tttaacagtc 120
 gttaaagata atgatgcacc acaaaagtat tttgtaccag ttatgccggc aagtgaagtg 180
 acaggcacat ttgatttaat tattttactc actaaaacac cacaactaga ccgcatgtta 240
 acagatattc agcctattat aacggatact acaaaattat tggattatc aaacggtttg 300
 ggtaatatgg aagtgatggc aaagcacgtg tcacgccatc aaattttggc tgggtgtcaca 360
 ttatggacat cgtcactaat aaagccaggt gaaatacatg ttactggtag tggctctatt 420
 aaattacaag caattggcga tgctgatgtc caaagtatag cggatgcttt gaatcagggt 480
 ggcttaaacg ccgaaattac cccagatgtg atgacagcaa tttggcataa ggcagggtatc 540
 aacgcgggtg tcaatccttt atccgtgttg ttaaagtcaa atattgctga atttggcaca 600
 gctggcaatg ccatggatct agcattgaat attctagatg agatgaagca agttgggtgcg 660
 tcacaaggca ttaaagttga cgttagtggg attatgacgg acttgagtca gttacttaaa 720
 ccagaaaatg caggtaatca ttttccgtca atgtaccaag atattcaaaa tggtaaacgt 780
 actga 785

<210> 12
 <211> 20
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence:Artificially
 Synthesized Sequence

<400> 12
 tcacttgccg gcataactgg 20

<210> 13
<211> 23
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:Artificially
Synthesized Sequence

<400> 13
gtcacaaggc attaaagttg acg 23

<210> 14
<211> 44
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:Artificially
Synthesized Sequence

<400> 14
gtcgaattct atcatgaaaa ttgcaattgc aggatttggt gcac 44

<210> 15
<211> 58
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:Artificially
Synthesized Sequence

<400> 15
gataagctta ctagtattaa atttcaaagt tttcttgctg ttttgctaata ttaacacg 58